

USSN 09/963,520
 Amdt. dated Oct 27, 2005
 Reply to Office Action July 27, 2005

The listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (currently amended) ~~A method of selecting a routing datapath data through a between an active datapath and a redundant datapath for a communication device having respective switching fabrics providing active and redundant datapaths, and wherein either of said switching fabrics can be made active to provide the active datapath and wherein the other switching fabric provides the redundant datapath, said method comprising:~~
- (i) ~~Continually monitoring for a faults occurring detected and cleared in said active datapath and said redundant datapaths switching fabrics;~~
 - (ii) ~~Reporting said detected and cleared faults to a demerit engine;~~
 - (iii) ~~Upon detection of said fault, evaluating severity of said fault against a threshold; and if said severity of said fault exceeds said threshold Maintaining a record of the health of each switching fabric in said demerit engine;~~
 - (iii) ~~Updating said demerit engine as said cleared and detected faults are reported;~~
 - (iv) ~~Providing a mechanism to initiate rapid switching of the data from the active datapath to the redundant datapath upon detection of a fault;~~
 - (iv) ~~Disabling said mechanism while said demerit engine indicates the presence of faults in said switching fabrics; and~~
 - (vi) ~~Upon detection of a fault when said mechanism is disabled, applying a set of rules to determine which fabric to make active based on the health of the respective switching fabrics as determined by the records in said demerit engine;~~
 - (ii.1) ~~If said fault is associated with said active datapath, switching said routing datapath from said active datapath to said redundant datapath; and~~
 - (ii.2) ~~If said fault is associated with said redundant datapath, updating a health score associated with said redundant datapath with a score relating to said fault.~~
2. (currently amended) ~~A The method of selecting a routing datapath between an active datapath and a redundant datapath for a communication device as claimed in claim 1~~

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wherein a fault is only recognized if it has a severity above a predetermined threshold.

~~said step (i) comprises determining if said fault is a first fault for said active datapath;~~
~~and for said step (ii) if said fault is said first fault, setting said severity above said~~
~~threshold.~~

3. (currently amended) A method of selecting a routing datapath between an active datapath and a redundant datapath for a communication device, said method comprising steps of

- (i) Monitoring said active datapath for faults in said active datapath and generating a first fault report upon detection of each of said faults in said active datapath;
- (ii) Monitoring said redundant datapath for faults in said redundant datapath and generating a second fault report upon detection of each of said faults in said redundant datapath; ~~Monitoring for a first fault occurring in said active datapath;~~
- (iii) Upon detection of said first fault, switching said routing datapath to said redundant datapath; and

~~(iiiiv)~~ Monitoring for a subsequent fault occurring in said active datapath and said redundant datapath;

- (ivv) Tracking said subsequent fault with any previous faults for active and redundant datapaths and evaluating said subsequent fault with said any previous faults against a threshold by

a) Receiving said first fault report from a first monitoring module and updating a first fault report for said active datapath;

b) Receiving said second fault report from said second monitoring module and updating a second fault report for said redundant datapath; and

(c) Generating a comparison value of said first and second fault reports to identify which of said active and redundant datapaths has a better health; and

- (vi) If said threshold is exceeded and if said subsequent fault is associated with said active datapath, switching said routing datapath of said communications from

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- active datapath to said redundant datapath; and
wherein earlier faults are cleared; said first and second fault reports are updated to remove said earlier faults; and said first and second fault reports utilize separate data structures each comprising an entry for each element reporting said faults.
4. (canceled)
5. (canceled)
6. (canceled).
7. (canceled)
8. (currently amended) A-The method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 6-3 wherein:

data is sent through said active datapath and said redundant datapath at approximately the same time; and

upon switching of said routing datapath, causing said switching of said routing datapath at an egress point in said communication device.
9. (currently amended) A-The method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 8 wherein said egress point is an egress line card in said communication device.
10. (currently amended) A-The method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 9 wherein

said steps (i) and (iii) are conducted by a fault detection unit receiving fault messages from a driver associated with a physical location in said communication device related to said fault messages.
11. (currently amended) A-The method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 10 wherein

said fault detection unit debounces said fault messages and reports said fault messages to a fault analysis unit associated with said physical location.
12. (currently amended) A-The method of selecting a routing datapath between an

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active datapath and a redundant datapath as claimed in claim 11 wherein

said fault detection unit utilizes one state machine for each of said fault messages to denounce said fault messages.

13.(currently amended) ~~A-The~~ method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 11 wherein said fault analysis unit performs said step (iii).

14. (currently amended) ~~A-The~~ method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 12 wherein said fault detection unit utilizes global data to store information relating to each of said fault messages.

15.(currently amended) ~~A-The~~ method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 14 wherein for a given fault message, said fault detection unit accesses said global data to allow initiation of a state machine associated with said given fault.

16.(currently amended) ~~A-The~~ method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 15 wherein

for said step (iiiiv) said fault detection unit advises a fabric selection unit of said subsequent fault; and

said fabric selection unit performs said step (ivv).

17. (currently amended) ~~A-The~~ method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 16 wherein said fabric selection unit is located at a central location in said communication device.

18.(currently amended) ~~The~~A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 17 wherein said fabric selection unit assigns one of a plurality of fault weight values to each of said subsequent fault and said any previous faults.

19.(currently amended) A method of selecting a routing datapath between an active datapath and a redundant datapath of a communication device, said method comprising:

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- (i) Maintaining first and second data structures associated with respective first and second sets of components, wherein said first and second data structures are associated with said respective active and redundant datapaths, and each data structure includes an entry for each component of its associated set of components;
- (ii) Monitoring for an event occurring in either said active datapath or said redundant datapath;
- (iii) Upon detection of said event
 - (iii.1) Updating a first status associated with ~~a first set of components in said active datapath~~ said first data structure if said event occurred in said active datapath; and
 - (iii.2) Updating a second status associated with ~~a second set of components in said redundant datapath~~ said second data structure if said event occurred in said redundant datapath;
- (~~iii~~iv) Performing an evaluation said first status and said second status against at least one failure threshold; and
- (ivv) Selecting said routing datapath according to said evaluation.

20.(currently amended) A switch providing a routing datapath between a first datapath in a first switching fabric and a second datapath in a second switching fabric, said switch comprising

said first datapath being an active datapath;

said second datapath being a redundant datapath for said active datapath;

a fault detection unit associated with said first and second datapaths;

a fault analysis unit associated with said fault detection unit;

a fabric selection unit associated with said fault analysis unit, said fabric selection unit utilizing a demerit engine to maintain a record of the health of the first and second switching fabrics in response to detection and clearance of faults;

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a rapid switchover mechanism for effecting rapid switchover of said active and redundant data paths upon detection of a fault;

said fabric selection unit disabling said rapid switchover mechanism in the presence of faults recorded by said demerit engine; and

wherein if said rapid switchover mechanism is disabled said fabric selection unit applies a set of rules based on the health of said first and second switching fabrics as determined from said demerit engine.

wherein

~~said fault detection system monitors for a fault occurring in said active datapath and said redundant datapath;~~

~~Upon detection of said fault, said fault analysis unit evaluates severity of said fault against a threshold; and~~

~~if said severity of said fault exceeds said threshold~~

~~if said fault is associated with said active datapath, said fabric selection unit switches said routing datapath from said active datapath to said redundant datapath.~~

21.(currently amended) A switch providing a routing datapath between a first datapath in a first switching fabric and a second datapath in a second switching fabric, said switch comprising

said first datapath being an active datapath;

said second datapath being a redundant datapath for said active datapath;

a fault detection unit associated with said first and second datapaths;

a fault analysis unit associated with said fault detection unit; and

a fabric selection unit associated with said fault analysis unit,

wherein

said fault detection unit monitors for a first fault occurring in said active datapath;

upon detection of said first fault, said fabric selection unit switches said routing

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datapath to said redundant datapath;

said fault detection unit monitors for a subsequent fault occurring in said active datapath and said redundant datapath;

said fault analysis unit tracks and reports said subsequent fault to said fabric selection unit;

wherein said fabric selection unit maintains first and second data structures which track demerit scores for said first and second switching fabrics based on reports received from said fabric selection unit, and said data structures comprise an entry for each element of said first and second switching fabrics reporting faults; and

wherein upon detection of a fault said fabric selection unit determines whether to switchover said active and redundant datapaths based on the scores in said first and second data structures. ~~evaluates said subsequent fault with any previous faults for active and redundant datapaths and evaluates said subsequent fault with said any previous faults against a threshold; and~~

~~if said threshold is exceeded and if said subsequent fault is associated with said active datapath, said fabric selection unit switches said routing datapath from active datapath to said redundant datapath.~~

22.(currently amended) A-The switch as claimed in claim 21 wherein

said fault detection unit also

monitors said active datapath for faults in said active datapath and advises said fault analysis unit of said faults in said active datapath; and

monitors said redundant datapath for faults in said redundant datapath and and advises said fault analysis unit of said faults in said active datapath,

and

said fault analysis unit also

generates a first fault report of said faults in said active datapath and provides same to said fabric selection unit; and

generates a second fault report of said faults in said redundant datapath and

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provides same to said fabric selection unit.

23. (currently amended) ~~A~~ The switch as claimed in claim 22 wherein said fabric selection unit also generates a comparison value of said first and second fault reports to identify which of said active and redundant datapaths has a better health.

24.(new) The method as claimed in claim 1, wherein said demerit engine comprises first and second data structures containing entries corresponding to elements of said first and second switching fabrics reporting faults.

25.(new) The method as claimed in claim 1, wherein different demerit weights are assigned to different faults conditions in said demerit engine, and said set of rules takes into account said different weights in determining which switch fabric to make active.

26.(new) The switch as claimed in claim 20, wherein said demerit engine comprises first and second data structures containing entries corresponding to elements of said first and second switching fabrics reporting faults.

27.(new) The method as claimed in claim 1, wherein said demerit engine is configured to assign different demerit weights to different faults conditions in said demerit engine, and said fabric selection unit account said different weights in determining which switch fabric to make active.